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ABSTRACT

This report compares the on-task behavior (industriousness) of K-3 students in the demonstration school of the Kamehameha Early Education Program (KEEP) with that of children from classes in four public schools. Industriousness was measured by tallying the occurrence of such behaviors as working on an appropriate task, attending to the teacher, or generally behaving as the learning situation required. In general, only data collected in the morning during reading, language arts or kindergarten readiness classes were used in the analyses. Results indicated a higher level of on-task behavior in the KEEP classrooms than in the public school classrooms. These differences were significant for the comparisons between KEEP and three of the four public school classrooms. (BD)

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Technical Report #55

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## The Kamehameha Early Education Program

The Kamehameha Early Education Program (KEEP) is a research and development program of The Kamehameha Schools/Bernice P. Bishop Estate. The mission of KEEP is the development, demonstration, and dissemination of methods for improving the education of Hawaiian and Part-Hawaiian children. These activities are conducted at the Ka Na'i Pono Research and Demonstration School, and in public classrooms in cooperation with the State Department of Education. KEEP projects and activities involve many aspects of the educational process, including teacher training, curriculum development, and child motivation, language, and cognition. More detailed descriptions of KEEP's history and operations are presented in Technical Reports #1-4.

## Abstract

A comparison of on-task or student industriousness data gathered in KEEP's demonstration school with on-task data gathered in four public school classrooms in Kalihi is presented. It is concluded that, overall, KEEP's pupils are about 20% more industrious than their peers in comparison schools.

Technical Report #55

# A Comparison of the Industriousness Levels of KEEP and Public School Students

Ellen Antill Roland G. Tharp

This report presents a comparison of on-task or industriousness data gathered in KEEP's demonstration school with on-task data gathered in four public school classrooms in Kalihi.

From 1972-74, daily on-task data were gathered at KEEP for the following reason. When KEEP began, one of the major concerns of Hawaii educators was that many island children did not seem concerned with school success. They were most often described as "lazy," "don't care," "inattentive," etc. Since this complaint was so prevalent, during the first years of KEEP's operation, some emphasis was placed on increasing students' involvement with learning tasks, that is, on increasing student industriousness. The methods used in this effort have been described elsewhere (see Technical Reports #6, #12, #19, and #24). Industriousness was measured by the students' on-task behavior (i.e., how often they work, attend to the teacher, or generally behave as the learning situation requires). Using the system described in Technical Reports #6 and #19, for two years, daily measurements of on-task, as opposed to off-task (inattentiveness) and disruptiveness (distracting teachers and/or peers), were taken, along with measurements of teachers' frequency of positive reinforcement (see Technical Report #56). (In later years, spot checks were used to measure student and teacher behavior.) These measures of student behavior correlated well with measures of actual achievement, such as the number of pages completed in learning centers (see Technical Report #6).

At the end of two years, KEEP had succeeded in significantly raising

industriousness. KEEP continues to maintain a high, stable level of on-task. As presented in previous reports, however, the success of this effort was measured solely in terms of data collected at KEEP. KEEP felt that it was also important to substantiate its claim that it had indeed achieved its goal by comparing the diligence of its students with that of students in the public schools.

Comparison data will be presented for three schools observed in 1973-74 and for one school observed in 1975. Although we attempted to compare data gathered on the same days, for both years the problem of KEEP observer scheduling sometimes made comparisons inexact in terms of time. While research assistants collected data in the field, often no one was available to collect KEEP data the same day. In such cases, for purposes of comparison, the nearest day preceding or following the public schools' observation was chosen. Generally, only data collected in the morning during language arts or reading or kindergarten readiness activities, were used.

## 1973-74

### Behavioral Code

Three mutually exclusive behaviors were observed. These were:

On-task: Any behavior appropriate to the task demands of the particular situation. This mainly involved working on an assignment, attending to the teacher, following instructions, cooperative work or play with peers, and between-task activities (e.g., getting materials or moving from one activity to another).

Off-task: Any behavior inappropriate to the task demands of the particular situation. This mainly involved daydreaming, watching other students work, or wandering away from the designated work area.

Disruptive: Any behaviors which interfered with peers or teachers or

both. Examples are shouting, crying, fighting, running about, throwing objects, and inappropriate socializing (chatting to other students about matters unrelated to the work at hand).

Recording Procedure

The coding procedure used at KEEP in 1973-74 was a search technique. The observer had a roster with students listed according to the way they were grouped in the classroom. Beginning at the top of the list, the observer scanned the classroom until he spotted the child to be observed first. Upon finding him, the observer recorded the child's behavior at that instant: marking a "+" if he was on-task, a "-" if he was off-task, and a "D" if he was disruptive next to the child's name on the list. The observer then found the child listed next on the roster and repeated the procedure. After each student was observed once, the cycle was repeated two more times. The amount of time it took to do one roster (usually one grade or 28 students) ranged from five to 15 minutes with a mean of about 10 minutes. All KEEP data were collected from the observation deck.

At the comparison schools, however, this method of observation was modified since it was impractical for the observer to learn the names of the students. Instead, the sweep procedure was used. The observer sat as unobtrusively as possible in the classroom, and, starting at one end of the room, simply counted each child as being on-task, off-task, or disruptive until he had a tally mark for each child in the classroom at that time in three cycles each observation. Each observation took about 10 minutes. This count was done about two or three times a morning at 15 minute intervals. (Intervals were spent coding teacher behavior.)

Observer reliability obtained at KEEP was $\geq .80$ for all three categories combined across the pairs of observers who collected the data.

All comparisons are for equivalent grade levels at KEEP and comparison schools.

School 1

Fifty-eight kindergarten and first grade children were observed. They were in a Hawaii English Program (HEP) class, held in a single classroom, and were taught by three female teachers.

The teachers were to be participants in a workshop in positive reinforcement held at KEEP in the spring of 1974. The data presented are for preworkshop "baseline" data. The data were collected for three days late in April (see Technical Report #33).

Table 1 presents the means and standard deviations for the three observed behaviors for KEEP and for School 1.

Table 1

Mean Percentages & Standard Deviations: On-task, Off-task, & Disruptive
KEEP & School 1

| Group | No. of Observations | On-task $\bar{X}$ | On-task SD | Off-task $\bar{X}$ | Off-task SD | Disruptive $\bar{X}$ | Disruptive SD |
|---|---|---|---|---|---|---|---|
| KEEP | 3 | 84.00 | 10.39 | 16.00 | 10.39 | 0 | 0 |
| School 1 | 3 | 60.33 | 7.37 | 34.33 | 1.52 | 5.33 | 8.39 |

Across individual observations, the range of on-task at KEEP was 78% to 96% while the range of on-task at School 1 was 52% to 71%. An independent *t*-test showed that the rate of on-task was significantly higher at KEEP ($t(4) = 3.21$, $p < .05$).

School 2

Forty-six children in a combined kindergarten-first grade were observed. They were taught by three female teachers in a single classroom. (These data were collected as baseline measures for the same workshop as for School 1.)

These data were collected over four days late in April. Table 2 gives the means and standard deviations for KEEP and for School 2.

Table 2

Mean Percentages & Standard Deviations: On-task, Off-task, & Disruptive
KEEP & School 2

| Group | No. of Observations | On-task $\bar{X}$ | On-task SD | Off-task $\bar{X}$ | Off-task SD | Disruptive $\bar{X}$ | Disruptive SD |
|---|---|---|---|---|---|---|---|
| KEEP | 4 | 91.75 | 9.25 | 8.25 | 9.25 | 0 | 0 |
| School 2 | 4 | 74.25 | 4.64 | 23.25 | 5.90 | 2.50 | 2.38 |

Across individual observations, the range of on-task at KEEP was 78% to 95% while at School 2 it was 70% to 80%. An independent $t$-test again showed that KEEP had a significantly higher on-task ($t(6)=3.38$, $p < .025$).

School 3

Two self-contained kindergarten classrooms (Class A and Class B) at a school located in a public housing area from which many KEEP students come were observed. There were about 25 students in each class and each class was taught by one female teacher. These data were collected for the sole purpose of comparison with KEEP. They were collected in the morning over three days in fall (kindergarten readiness), three days in winter (two for Class B) and three days in the spring. The latter six days represent language arts data. KEEP data were collected during kindergarten readiness in fall and during language arts (kindergarten and first grade combined) in winter and spring. Table 3 gives the means and standard deviations for on-task, off-task, and disruptive behaviors for KEEP and the two classes at School 3.

Table 3

Mean Percentages & Standard Deviations: On-task, Off-task, & Disruptive KEEP & School 3

| Group | No. of Observations | On-task $\bar{X}$ | On-task SD | Off-task $\bar{X}$ | Off-task SD | Disruptive $\bar{X}$ | Disruptive SD |
|---|---|---|---|---|---|---|---|
| KEEP | 9 | 85.11 | 9.04 | 14.44 | 8.27 | .66 | .41 |
| Class A (T1) | 9 | 83.44 | 6.76 | 12.77 | 6.45 | 3.88 | 2.14 |
| Class B (T2) | 8 | 80.75 | 8.17 | 15.87 | 2.38 | 2.38 | 3.37 |
| Class A and B | 17 | 82.17 | 7.35 | 14.23 | 7.26 | 3.64 | 2.20 |

The range of on-task across individual observations for KEEP was 72% to 100%. For Class A, the range was 75% to 94% and for Class B, 72% to 95%. KEEP had slightly higher (a mean of 2% to 5%) on-task means than both classes of School 3, and an off-task rate equivalent with School 3 overall. Both classes of School 3 had a higher mean disruptive rate. None of these differences was statistically significant, and, since the on-task rate was high for both KEEP and the comparison group, the differences would seem to have little practical significance.

## 1975

### Behavioral Code

The 1973-74 on-task, off-task, and disruptive code was still in effect in 1975.

### Recording Procedure

The search technique described in the preceding section on coding procedures at KEEP in 1973-74 was used with one modification. This was that the observations were confined to one cycle rather than three (so that the observer

could collect data on all the classes at KEEP, about 100 students). The observations done in the field followed the procedure of previous years. The observer began at one end of the room and marked each child as being either on-task, off-task, or disruptive until each child was counted once. This was done in between coding teachers (i.e., at 15 minute intervals). The observations took about 10 to 15 minutes. Reliability obtained at KEEP between two independent observers was 81% or better for each of the three categories.

School 5*

A three-on-two classroom taught by three female teachers was observed. A KEEP research assistant collected data on 45 to 52 second and third grade students for three days in November with two to three cycles a sweep per day. These data are presented in the usual manner.

On days in which the research assistant did not observe in the field, she observed at KEEP. (These data were gathered at KEEP specifically for this report since the daily monitoring system was not in operation that year.) Since these are the most recent data on KEEP students, they are presented in a more detailed fashion: by means per teacher observed.

The KEEP observations are for kindergarten through third grade and sampled a variety of subjects.

Table 4 presents the means and standard deviations for on-task, off-task, and disruptive behaviors for KEEP and for School 5.

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* Comparison School 4, although observed for other purposes (see Technical Report #56) was not observed for on-task data.

Table 4

Mean Percentages & Standard Deviations: On-task, Off-task, & Disruptive

KEEP & School 5

| Group | No. of Observations | On-task $\bar{X}$ | On-task SD | Off-task $\bar{X}$ | Off-task SD | Disruptive $\bar{X}$ | Disruptive SD |
|---|---|---|---|---|---|---|---|
| KEEP* | | | | | | | |
| Teacher 4 | 5 | 91.80 | 3.90 | 8.20 | 3.83 | 0 | 0 |
| Teacher 5 | 3 | 95.60 | 4.50 | 4.30 | 4.50 | 0 | 0 |
| Teacher 6 | 9 | 85.40 | 9.90 | 14.55 | 9.90 | 0 | 0 |
| Teacher 7 | 6 | 86.70 | 10.58 | 13.30 | 10.58 | 0 | 0 |
| Teacher 9 | 9 | 87.66 | 5.57 | 11.77 | 5.62 | .55 | 1.67 |
| Teacher 10 | 9 | 77.77 | 6.80 | 19.44 | 5.08 | .55 | 1.67 |
| Teacher 11 | 4 | 84.25 | 5.74 | 15.75 | 5.74 | 0 | 0 |
| Teacher 12 | 7 | 94.14 | 6.44 | 5.85 | 6.44 | 0 | 0 |
| Total | 52 | 87.90 | 5.83 | 11.64 | 5.18 | .13 | .25 |
| School 5 | 6 | 73.83 | 7.68 | 26.16 | 7.68 | 0 | 0 |

The range across teachers across observations at KEEP was 72% to 100% while the range across teachers across observations at School 5 was 65% to 98%.

Overall, KEEP had a higher on-task rate, about 88% compared to School 5's rate of about 74%. KEEP's off-task rate was about ten mean percentage points lower than School 5's and the disruptive rate was minimal.

Performing a statistical test on these data was made difficult because KEEP data were based on observation by teacher and the comparison data were

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* Teachers receive the designations below to insure consistency between the present report and Technical Report #56.

based on observation across teachers. Taking total observations would give extremely unbalanced Ns, (52 versus 6). However, an independent t-test was computed on these data by taking the means across teachers for the first three days of observations (since T5 only had three data points) and comparing these means to the means for all six observation periods for the six public school teachers. It was found that KEEP had a significantly higher on-task rate ($t(7)=2.74$, $p<.05$).

To make comparisons equivalent in grade level, means were computed for the four teachers (Ts 6, 7, 9, and 10) who taught second and third grade at KEEP. Their students' mean on-task was 84.18 (SD=8.32), while off-task was 16.10% (SD=7.35) and disruptive was .06 (SD=.24) (see Table 5). Again, a t-test was done, using the first six days of observation (least number of data points) across teachers. KEEP second and third grade teachers' students, as a group, had a significantly higher on-task rate ($t(10)=2.53$, $p<.05$).

Table 5 presents a summary of means and standard deviations for on-task, off-task, and disruptive behavior for KEEP and its comparisons.

## Discussion

To make the comparison equal--in so far as possible--in time, subject, and number of teachers, only a limited number of cases, relative to the enormous amount of KEEP data, can be presented. Overall, KEEP maintains a high level of industriousness, whether viewed across teachers, day, subject, or week. We cannot determine overall rate for other schools.

Any comparison is made difficult, too, by the dissimilarity of KEEP's student population to the student population of the comparison schools in Kalihi. Due to the sampling procedures, 75% of the students enrolled at KEEP come from families receiving welfare assistance from the state and 80%

Table 5

Summary of On-task, Off-task, & Disruptive Means & Standard Deviations

KEEP & Comparisons

| Group | Grade Level | No. of Observations | On-task $\bar{X}$ | On-task SD | Off-task $\bar{X}$ | Off-task SD | Disruptive $\bar{X}$ | Disruptive SD |
|---|---|---|---|---|---|---|---|---|
| KEEP | K-1 | 3 | 84.00 | 10.39 | 16.00 | 10.39 | 0 | 0 |
| School 1 | K-1 | 3 | 60.33 | 7.37 | 34.33 | 1.52 | 5.33 | 8.39 |
| KEEP | K-1 | 4 | 91.75 | 9.25 | 8.25 | 9.25 | 0 | 0 |
| School 2 | K-1 | 4 | 74.25 | 4.64 | 23.25 | 5.90 | 2.50 | 2.38 |
| KEEP | K-1 | 9 | 85.11 | 9.04 | 14.44 | 8.27 | .66 | .41 |
| School 3 | K | 17 | 82.17 | 7.35 | 14.23 | 7.26 | 3.64 | 2.20 |
| KEEP | K-3 | 52 | 87.90 | 5.83 | 11.64 | 5.18 | .13 | .25 |
| School 5 | 2-3 | 6 | 73.83 | 7.68 | 26.16 | 7.68 | 0 | 0 |
| KEEP | 2-3 | 33 | 84.18 | 8.82 | 16.10 | 7.35 | .06 | .24 |

are part-Hawaiian. No other school in Honolulu has percentages this high.

Although no definitive conclusion can be made, within the limits of the data, KEEP's students' level of diligence or on-task compares favorably with the four control schools' students (see Table 5). KEEP's on-task is significantly higher than Schools 1, 2, and 5, and about 3 mean percentage points higher than School 3's.

Overall, and emphasizing the most recent data, it appears that KEEP's pupils are about 20% more industrious than their peers in comparison schools.